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ABSTRACT

The United States Training and Employment Service General Aptitude Test Battery (GATB), first published ib 1947, has been included in a continuing program of research to validate the tests against success in many different occupations. The GATB consists of 12 tests which measure nine aptitudes: General Learning Ability; Verbal Aptitude; Numerical Aptitude; Spatial Aptitude; Form Perception; Clerical Perception; Motor Coordination; Finger Dexterity; and Manual Dexterity. The aptitude scores are standard scores with 100 as the average for the general working population, and a standard deviation of 20. Occupational norms are established in terms of minimum qualifying scores for each of the significant aptitude measures which, when combined, predict job performance. Cutting scores are set only for those aptitudes which aid in predicting the performance of the job duties of the experimental sample. The GATB norms described are appropriate only for jobs with content similar to that shown in the job description presented in this report. A description of the validation sample is also included. (AG)

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TECHNICAL REPORT

ON

STANDARDIZATION OF THE GENERAL APTITUDE TEST BATTERY

FOR

KEY-PUNCH OPERATOR (clerical) 1-25.62

B-449 or S-180

TM 001 611

U. S. Employment Service in
Cooperation with
Alabama, Nebraska and North Carolina
State Employment Services

U. S. DEPARTMENT OF LABOR
Bureau of Employment Security
Washington 25, D. C.

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GATB # 2317C
690-March, 1952
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KEY-PUNCH OPERATOR (clerical) 1-25.62

B-449 or S-180

Summary

The General Aptitude Test Battery, B-1001, was administered to Sample I, which was composed of 48 women employed as Key-Punch Operators 1-25.62, during May 1952. This sample was employed at the State Employment Security Commission and the State Revenue Department in Raleigh, North Carolina. The criterion consisted of broad category supervisory ratings.

The General Aptitude Test Battery, B-1002A, was administered to Sample II, which was composed of 54 women employed as Key-Punch Operators 1-25.62, during the period March 17, 1959 to July 21, 1959. This sample was employed at five departments of the State government in Montgomery, Alabama. The criterion consisted of supervisory ratings on a descriptive rating scale.

The General Aptitude Test Battery, B-1002A, was administered to Sample III, which was composed of 91 women employed as Key-Punch Operators 1-25.62, during the period July 24, 1959 to January 27, 1960. This sample was employed at eleven companies located in Lincoln and Omaha, Nebraska. The criterion consisted of supervisory ratings on a descriptive rating scale.

The three samples were analyzed separately and in combination. On the basis of mean scores, standard deviations, correlations with the criterion, job analysis data, and their combined selection efficiency, Aptitudes G-Intelligence, N-Numerical Aptitude, Q-Clerical Perception and F-Finger Dexterity were selected for inclusion in the test norms.

GATB Norms for Key-Punch Operator 1-25.62 - B-449 or S-180

Table I shows, for B-1001 and B-1002, the minimum acceptable score for each aptitude included in the test norms for Key-Punch Operator 1-25.62

TABLE I

Minimum Acceptable Scores on B-1001 and B-1002 for B-449 or S-180

B-1001			B-1002		
Aptitude	Tests	Minimum Acceptable Aptitude Score	Aptitude	Tests	Minimum Acceptable Aptitude Score
G	CB-1-H CB-1-I CB-1-J	90	G	Part 3 Part 4 Part 6	85
N	CB-1-D CB-1-I	90	N	Part 2 Part 6	85
Q	CB-1-B	90	Q	Part 1	90
F	CB-1-O CB-1-P	100	F	Part 11 Part 12	95

Effectiveness of Norms

The data shown in Table V-D indicates that 35 of the 55 poor workers, or 64 percent of them, did not achieve the minimum scores established as cutting scores on the recommended test norms. This shows that 64 percent of the poor workers would not have been hired if the recommended test norms had been used in the selection process. Moreover, 101 of the 121 workers who made qualifying test scores, or 84 percent, were good workers.

TECHNICAL REPORT

I. Purpose

This study was conducted to determine the best combination of aptitudes and minimum scores to be used as norms on the General Aptitude Test Battery for the occupation of Key-Punch Operator 1-25.62.

II. Sample

This study is based on three samples of workers engaged in the occupation of Key-Punch Operator 1-25.62.

Sample I - North Carolina

The General Aptitude Test Battery, B-1001, with the exception of Part E was administered in May 1952 to 49 women employed as Key-Punch Operators 1-25.62. One woman was eliminated from the sample because criterion data were not available, leaving a final sample of 48. Nine women in the final sample were employed by the State Employment Security Commission and 39 by the State Revenue Department in Raleigh, North Carolina. The departments concerned have a two-week training period and operators are expected to reach average speed approximately ten days after completion of the training program. All workers in the sample had at least one month on the job.

Sample II - Alabama

The General Aptitude Test Battery, B-1002A, was administered to 54 women employed as Key-Punch Operators in five different branches of State government in Montgomery, Alabama between March 17, 1959 and July 21, 1959. The departments, number from each department, and dates of testing were as follows:

		3-17-59	3-19-59	4-22-59	7-21-59	Total
Highway						
Accounting Section	(9)	3	3	0	0	6
Computing Section	(4)	0	0	3	0	3
Industrial Relations	(18)	4	4	7	0	15
Pensions and Security	(5)	0	0	5	0	5
Revenue	(39)	4	4	0	17	25
Totals	(75)	11	11	15	17	54

The figures in parenthesis indicate the normal complement of the department or section.

In order to obtain a sample large enough for test developmental purposes, each of the supervisors involved agreed to include all Key-Punch Operators who had completed the usual six months probationary period. One Key-Punch Operator was ill on the date of testing, two were eliminated because of

physical or other handicaps which precluded testing. Otherwise, the difference in normal complement and number tested resulted from positions which were vacant or because individuals in them had not completed six months as Key-Punch Operators. One individual with only five months experience was inadvertently included for testing and it was decided to retain her in the final sample since the supervisor felt she had progressed sufficiently to be rated among with the other workers. The final experimental sample consisted of 54 female Key-Punch Operators.

Applicants for the job of Key-Punch Operator are selected on the basis of the following qualifications: Any combination of training and experience equivalent to: Graduation from a standard senior high school, including or supplemented by a course in typing or some some experience in the operation of alphabetical or numerical key-punch equipment.

Those applicants acquiring these qualifications and skills, knowledges, and abilities through the IBM two-week, 80 hour free training course must first meet the following requirements: Individuals right out of high school preferred, top age limit of 40 with individuals under 30 years of age preferred. Must type a minimum of 40 errorless words-per-minute. Must make a satisfactory score on Card Punch Aptitude Test prepared by Psychological Corp.; test consist of two parts: Name Comparison, a measure of clerical aptitude very similar to Part 1 of the GATB, and a Coding test similar to USES C-32.

Applicants who have had experience as Key-Punch Operators in private industry are accepted as are qualified typists who have been allowed to learn the work by filling in on the job when a regular operator was out.

All applicants accepted by the State Personnel Department are given a Merit System Examination. This is a written test of clerical ability which includes the measurement of ability to copy rapidly and accurately and to detect differences in spelling of words. From the results of this test a merit system register is established and openings are filled from among the top three individuals on the register. The individual, when employed, is required to serve a six-month probationary period (in one department workers are terminated without prejudice if they do not measure up to the expectations of the supervisor within this period).

There is no way of determining the proportion of applicants screened out by the IBM Card Punch Aptitude Test or by the State Merit System Examination as such records are not maintained.

Sample III - Nebraska

The General Aptitude Test Battery, B-1002A, was initially administered to 109 Key-Punch Operators; 18 were excluded for one of the following reasons: part-time employment, leaving the company, work on different make of equipment (Remington Rand instead of IBM), and insufficient criterion ratings. Thus, the final sample consisted of 91 subjects (working on IBM equipment) from the following establishments:

Plant	Date of Testing	Number of Persons in study
Back to the Bible Broadcast, Lincoln	8-13-59	9
Bankers Life Insurance Company of Nebraska, Lincoln	8-6-59	5
Central Electric & Gas Company, Lincoln	8-11-59	6
Central National Insurance Company, Omaha	10-23-59	10
Cudahy Packing Company, Omaha	1-14-60	9
Lincoln Telephone & Telegraph Company, Lincoln	1-11-60	10
Mutual of Omaha Insurance Company, Omaha	7-24-59	12
Northern Natural Gas Company, Omaha	12-15-59	10
Omaha Public Power District, Omaha	12-14-59	7
SAC/Offutt Air Force Bases, Omaha	11-17-59	10
Security Mutual Insurance Company, Lincoln	10-15-59	3
		91

All of the Key-Punch Operators were females. The arrangements for obtaining the sample were made through direct contact of the Administrative Office with the presidents of the local chapters of the National Machine Accountants Association and with the machine accountants and personnel officers of the respective companies.

Almost all of the companies in the sample (with the exception of the Offutt Air Force Bases) reported that they hire employees as Key-Punch Operators only after they have had at least two weeks of basic training (half-days) at one of the IBM branch offices. Information given by the local IBM branch office indicated that the two-week instruction period

would enable a trainee fairly proficient in typing to do simple key-punching at her company. To reach average production, which depends to a certain degree upon familarization with the company's forms, record sheets, and with the procedures and cycles, a period of about six months was given by most companies.

In order to become a Key-Punch Operator with the Air Force, applicants must pass the United States Civil Service Commission Test for Card-Punch Operator, and may either be classified as holding a GS-2 or GS-3 rating depending upon successfully meeting the requirements for one of the two grades.

Mutual of Omaha Insurance Company administers to all new Key-Punch Operators the Psychological Corporation IBM Key-Punch Operator Test. The passing grade for being eligible for open positions or for training could not be ascertained from the company.

Table II shows the means, standard deviations, ranges and Pearson product-moment correlations with the criterion for each sample.

TABLE II

Number of Workers in Sample (N), Means (M), Standard Deviations (σ), Ranges and Pearson Product-Moment Correlations with the Criterion (r) for the Variables of Age, Education, and Experience.

Key-Punch Operator 1-25.62

	N	M	σ	Range	r
Age (years)					
Sample I - North Carolina	48	23.2	5.5	18-46	-.171 #
Sample II - Alabama	54	31.8	11.7	19-66	.131
Sample III - Nebraska	91	27.2	8.6	18-56	.133
Combined Sample	193	27.5	9.5	18-66	
Education (years)					
Sample I - North Carolina	48	12.2	.7	11-14	.049 #
Sample II - Alabama	54	12.1	.9	9-15	-.097
Sample III - Nebraska	91	12.1	.7	9-15	-.012
Combined Sample	193	12.1	.7	9-15	
Experience (months)					
Sample I - North Carolina	48	24.6	29.5	1-123	-.052 #
Sample II - Alabama	54	77.1	59.9	5-207	.323*
Sample III - Nebraska	91	26.9	26.4	2-144	.282**
Combined Sample	193	40.4	45.5	1-207	

#Corrected for Broad Categories

*Significant at the .05 level

**Significant at the .01 level

The data in Table II indicate that there are no significant correlations with the criterion for age, education or experience for Sample I (North Carolina), or between age and education and the criteria for Sample II (Alabama) and Sample III (Nebraska). The correlation between experience and the criterion is significant at the .05 level for Sample II (Alabama) and at the .01 level for Sample III (Nebraska). This indicates that (1) those workers with more experience are better workers or (2) supervisors tended to give higher ratings to workers with more experience. The data in Table II indicate that these samples are suitable for test development purposes with respect to age, education and experience.

III. Job Description

Job Title: Key-Punch Operator, 1-25.62

Job Summary:

Operates alphabetical and numerical key-punch machine, rapidly and accurately punching coded and uncoded data onto tabulating cards. Places cards to be punched into card hopper, manipulates keys on keyboard to punch data onto cards, removes completed cards from stacker. May operate a verifying machine to check accuracy of work.

Work Performed:

1. Sets up at work station.

Obtains records from which cards are to be punched from supervisor or from central point. Places source data on reading board. Picks up blank cards from box and places them in card hopper. Turns on main line switch. Fastens program card around program drum and inserts it in machine.

2. Punches coded and uncoded data into tabulating cards.

Following written information on records punches corresponding numbers or symbols on machine keyboard (similar to the keyboard of a typewriter), thereby transcribing the coded and/or uncoded data into perforations on the tabulating card.

3. Removes completed work.

Picks up completed cards, by hand, and removes them from card stacker. Carries completed work in batches or in boxes back to supervisor or to central point where it can be picked up for verifying.

IV. Experimental Battery

All of the tests of the GATB, B-1001, except Part E were administered to Sample I.
All of tests of the GATB, B-1002A, were administered to Sample II and Sample III.

V. Criteria

Sample I - North Carolina

Supervisory ratings, production records, and a work sample test were all considered. Three supervisors were involved and they held several conferences to decide the basis upon which to make their subjective ratings of A, B, and C. The supervisor of the largest group (33) gave his method of rating for consideration as follows:

Basis for subjective ratings: The supervisor rated employees in "Above Average", "Average", or "Below Average" group based on (1) speed and accuracy in punching cards and (2) on interest in the work.

Based on studies made over a considerable period of time, the supervisor stated that an average worker should punch from 1800 to 2500 cards per week. Those punching above 2500 cards are above average, and those punching less than 1800 cards per week are "below average workers". No quantitative number was set for "errors made" but the supervisor weighed this factor with the number of cards punched in arriving at subjective ratings for the 33 employees.

Production records were obtained (average weekly and hourly production over three weeks period), but after careful study and conferences with the three supervisors, it was felt that the material punched in the different departments was not sufficiently similar to warrant the use of the figures for the total sample. Correlations were run between the GATB aptitude scores and the production records for 30 out of the 33 from the Income Tax Division, including the Verifiers. No significant correlations were found.

A five minute work sample test was also devised, but it was not possible to administer this test to the total sample.

The criterion finally selected for use in this study consisted of broad category supervisory ratings, as this was the only method found applicable to the total sample and comparable with the criterion of Sample II and Sample III.

Sample II - Alabama

Two sets of criterion measures were obtained. The Descriptive Rating Scale of the USES, Form SP-21, 11/56, was used for obtaining both measures. At the suggestion of one supervisor and by agreement with the other four supervisors item H was omitted from the ratings. This item, it was decided, was not pertinent to the job of Key-Punch Operator. The ratings were obtained as follows:

	1st Rating	2nd Rating
Industrial Relations	7-23-59	9-16-59
Highway-Accounting	7-27-59	9-15-59
Highway-Computer	7-27-59	9-15-59
Pensions and Security	7-28-59	9-17-59
Revenue	8-19-59	9-17-59

The Product-Moment correlation between the two descriptive rating scale scores for each individual was .80, sufficiently high for validation purposes. The final criterion was the sum of the two descriptive rating scale scores for each individual.

Sample III - Nebraska

The criterion consisted of supervisory ratings obtained during the period August 5, 1959 to March 23, 1960. Employees were rated on a five-point Descriptive Rating Scale (SP-21) either by the immediate supervisor or by the machine accountant in charge of the department. Two sets of ratings on SP-21 were obtained for each individual in the study. These two sets of ratings correlated .90. This relationship was found to be highly significant (.01 level). It was therefore decided to sum the two ratings for use as the final criterion for this study.

Prior to the beginning of the actual testing, an attempt was made to devise a means by which objective criterion measures could be obtained. This device consisted of a three-minute punching exercise (53 strokes per card with manual release of the punched card) which was preceded by a practice period. The score of this exercise was determined by counting the cards punched properly.

In all subsamples, the administration of the punching exercise followed the administration of the General Aptitude Test Battery.

Scores on the punching exercise ranged from 1 to 14, with a mean of 7.033 cards and a standard deviation of 2.899. The objective criterion measure correlated .156 with Age, -.084 with Education, and .213 with Experience. None of these correlations was found to be significant.

Determining the relationship between the supervisory ratings and the scores on the three-minute punching exercise, a correlation coefficient of .289 was found. Despite the fact that this relationship was found to be significant at the .01 level it was small in magnitude, and, therefore, a combination of the two criteria was not made.

The consideration of whether to establish a multiple-hurdle criterion was decided against since the only significant relationship (at the .05 level) between aptitudes and the number of cards punched right was that for Aptitude Q.

VI. Qualitative and Quantitative Analyses

A. Qualitative Analysis:

The job analysis indicated that the following aptitudes measured by the GATB appear to be important for this occupation

Clerical Perception (Q) - required for perceiving pertinent detail in written records, observing differences in copy and mentally coding material to be punched into tabulating cards.

Motor Coordination (K) - required for reading source material, coding, and all the while rapidly and accurately pressing keys on keyboard with fingers.

Finger Dexterity (F) - required for rapidly moving fingers over keyboard, pressing proper keys.

Manual Dexterity (M) - required for handling records, boxes of cards, batches of cards, loading and unloading hopper.

On the basis of the job analysis data, Aptitude V is considered obviously unimportant for performing the duties of this job and is considered an "irrelevant" aptitude.

B. Quantitative Analysis:

Table III-A shows the means and standard deviations for the aptitudes of the GATB for each sample separately and for the combined sample. The means and standard deviations are comparable to general working population norms with a mean of 100 and a standard deviation of 20 for each aptitude.

Table III-B shows the correlations between the criterion and the aptitudes of the GATB for each sample.

TABLE III - A

Means (M) and Standard Deviations (σ) for the Aptitudes of the GATB for Each Sample Seperately and for the Combined Sample.

Key-Punch Operator 1-25.62

Aptitudes	Sample I-N. C. N = 48		Sample II-Ala. N = 54		Sample III Nebr. N = 91		Combined Sample N = 193	
	M#	σ#	M	σ	M	σ	M	σ
G	98	12	97.8	11.8	103.4	13.5	100.5	12.7
V	99	12	100.8	11.2	102.9	14.6	101.4	13.0
N	96	15	98.0	12.8	104.1	12.9	100.4	13.5
S	98	14	94.6	16.2	103.5	14.3	99.7	14.8
P	106	17	98.5	15.1	110.9	14.8	106.4	15.6
Q	113	13	108.7	15.8	120.4	12.7	115.4	13.8
K	108	17	106.8	14.8	108.1	14.0	107.8	15.1
F	101	15	101.2	18.7	108.2	16.8	104.4	17.0
M	102	18	104.1	17.2	102.6	19.6	102.9	18.7

B-1002 equivalents based on B-1001 data.

TABLE III-B

Pearson Product-Moment Correlations with the Criterion for the Aptitudes of the GATB for Each Sample

Key-Punch Operator 1-25.62

Aptitudes	Sample I-North Carolina N = 48#	Sample II-Alabama N = 54	Sample III-Nebraska N = 91
G	.488**	-.086	.284**
V	.447**	.139	.206*
N	.438**	-.175	.365**
S	.170	-.104	.093
P	.432**	-.093	.276**
Q	.556**	.046	.275**
K	.432**	-.067	.012
F	.435**	.031	-.010
M	.255	.099	-.070

#Corrected for Broad Categories

*Significant at the .05 level
**Significant at the .01 level

For a sample of 48 cases, correlations of .368 and .285 are significant at the .01 level and the .05 level of confidence, respectively. Aptitudes G, V, N, P, Q, K, and F correlate significantly with the criterion at the .01 level. No aptitudes correlate significantly with the criterion at the .05 level.

For a sample of 54 cases, correlations of .348 and .268 are significant at the .01 level and the .05 level of confidence, respectively. There are no significant correlations between the Aptitudes and the criterion.

For a sample of 91 cases, correlations of .269 and .206 are significant at the .01 level and the .05 level of confidence, respectively. Aptitudes G, N, P and Q correlate significantly with the criterion at the .01 level. Aptitude V correlates significantly with the criterion at the .05 level.

C. Selection of Test Norms

TABLE IV

Summary of Qualitative and Quantitative Data

Type of Evidence	Aptitudes								
	G	V	N	S	P	Q	K	F	M
Job Analysis Data									
Important						X	X	X	X
Irrelevant		X							
Relatively High Mean (N = 193)					X	X	X		
Relatively Low Sigma (N = 193)	X	X	X			X			
Significant Correlation with Sample I Criterion	X	X	X		X	X	X	X	
Significant Correlation with Sample II Criterion									
Significant Correlation with Sample III Criterion	X	X	X		X	X			
Aptitudes to be considered for trial norms	X		X		X	X	X	X	

Trial norms consisting of various combinations of three and four of Aptitudes G, N, P, Q, K and F with appropriate cutting scores were evaluated against the criterion by means of the tetrachoric correlation technique. A comparison of the results showed that B-1002 norms consisting of G-85, N-85, Q-90 and F-95 had the best selective efficiency.

VII. Validity of Norms

Sample I - North Carolina

The validity of the norms was determined by computing a tetrachoric correlation coefficient between the test norms and the criterion and applying the Chi Square test. The criterion was dichotomized by placing as close as possible to one-third of the sample in the low criterion group. A criterion critical score of 35 was used and resulted in 15 of the workers or 31 percent of the sample being placed in the low criterion group.

Table V-A shows the relationship between test norms consisting of Aptitudes G, N, Q and F with critical scores of 90, 90, 90 and 100 respectively, and the dichotomized criterion for Key-Punch Operator 1-25.62. Workers in the high criterion group have been designated as "good workers" and those in the low criterion group as "poor workers."

TABLE V-A

Validity of Test Norms for Key-Punch Operator 1-25.62

(B-1001: G-90, N-90, Q-90, F-100)

Sample I - North Carolina

N = 48

	Non-Qualifying Test Scores	Qualifying Test Scores	Total
Good Workers	10	23	33
Poor Workers	10	5	15
Total	20	28	48

$r_{tet} = .54$ $\quad X^2 = 4.214$

$\sigma_{r_{tet}} = .24$ $\quad P/2 < .025$

The data in the above table indicate a significant relationship between the test norms and the criterion for the sample.

Sample II - Alabama

The validity of the norms was determined by computing a tetrachoric correlation coefficient between the test norms and the criterion and applying the Chi Square test. The criterion was dichotomized by placing as close as possible to one-third of the sample in the low criterion group. A criterion critical score of 63 was used and resulted in 17 of the workers or 31 percent of the sample being placed in the low criterion group.

Table V-B shows the relationship between test norms consisting of Aptitudes G, N, Q and F with critical scores of 85, 85, 90 and 95 respectively, and the dichotomized criterion for Key-Punch Operator 1-25.62. Workers in the high criterion group have been designated as "good workers" and those in the low criterion group as "poor workers."

TABLE V-B

Validity of Test Norms for Key-Punch Operator 1-25.62

(B-1002: G-85, N-85, Q-90, F-95)

Sample II - Alabama

N = 54

	Non-Qualifying Test Scores	Qualifying Test Scores	Total
Good Workers	14	23	37
Poor Workers	12	5	17
Total	26	28	54

$r_{tet} = .50$ $\quad X^2 = 3.778$

$\sigma_{r_{tet}} = .22$ $\quad P/2 < .05$

The data in the above table indicate a significant relationship between the test norms and the criterion for the sample.

Sample III - Nebraska

The validity of the norms was determined by computing a tetrachoric correlation coefficient between the test norms and the criterion and applying the Chi Square test. The criterion was dichotomized by placing as close as possible to one-fourth of the sample in the low criterion group. A criterion critical score of 60 was used and resulted in 23 of the workers or 25 percent of the sample being placed in the low criterion group.

Table V-C shows the relationship between test norms consisting of Aptitudes G, N, Q and F with critical scores of 85, 85, 90 and 95 respectively, and the dichotomized criterion for Key-Punch Operator 1-25.62. Workers in the high criterion group have been designated as "good workers" and those in the low criterion group as "poor workers."

TABLE V-C

Validity of Test Norms for Key-Punch Operator 1-25.62

(B-1002: G-85, N-85, Q-90, F-95)

Sample III-Nebraska

N = 91

	Non-Qualifying Test Scores	Qualifying Test Scores	Total
Good Workers	13	55	68
Poor Workers	13	10	23
Total	26	65	91

$r_{tet} = .59$ $\chi^2 = 10.021$

$\sigma_{r_{tet}} = .19$ $P/2 = < .005$

The data in the above table indicate a significant relationship between the test norms and the criterion for the sample.

Combined Sample

The validity of the norms was determined by computing a tetrachoric correlation coefficient between the test norms and the criterion and applying the Chi Square Test.

The criteria for sample I and sample II were dichotomized by placing as close as possible to one-third of the samples in the low criterion group. The criterion for Sample III was dichotomized by placing as close as possible to one-fourth of the sample in the low criterion group. Combining the workers placed in the low criterion groups for the various samples resulted in 55 of the workers or 28 percent of the combined sample being placed in the low criterion group. Table V-D shows the relationship between test norms consisting of (B-1002) G-85, N-85, Q-90, F-95 and (B-1001) G-90, N-90, Q-90, F-100 and the dichotomized criteria for the various samples. Workers in the high criterion group have been designated "good workers" and those in the low criterion group as "poor workers."

TABLE V-D

Validity of Test Norms for Key-Punch Operator 1-25.62

(B-1002: G-85, N-85, Q-90, F-95)

(B-1001: G-90, N-90, Q-90, F-100)

Combined Sample

N = 193

	Non-Qualifying Test Scores	Qualifying Test Scores	Total
Good Workers	37	101	138
Poor Workers	35	20	55
Total	72	121	193

$r_{tet} = .55$ $X^2 = 21.254$

$\sigma_{r_{tet}} = .12$ $P/2 < .0005$

The data in the above table indicate a significant relationship between the test norms and the criterion for the sample.

VIII. Conclusions

On the basis of the results of this study, Aptitudes G, N, Q and F with minimum scores of 85, 85, 90 and 95 respectively, have been established as B-1002 norms for the occupation of Key-Punch Operator 1-25.62. The equivalent B-1001 norms consist of G-90, N-90, Q-90 and F-100.

IX. Determination of Occupational Aptitude Pattern

A significant relationship between OAP-9 and the criterion for the experimental sample was obtained. The proportion of the sample screened out by OAP-9 was .43, which is within the required range of .10 to .60. Therefore, the occupation Key-Punch Operator 1-25.62 will be allocated to OAP-9 of the existing 23 OAP's.